

Poultry sellers' perception and their effort for prevention strategy on *avian influenza* in Banda Aceh, Indonesia

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Abstract. A study was conducted to examine some poultry sellers' perception of the *Avian influenza* (birdflu) in nine locations (Ulee Kareng, Batoh, Lamnyong, Kampong Baru, Peunayong, Setui, Kampong Ateuk, and Neusu) in Banda Aceh Municipality, Indonesia. Primary data were obtained with the use of a structured questionnaire administered to ninety nine (99) respondents selected using proportional stratified random sampling, between November to December 2011. Information was obtained using the questionnaire sheets contain questions: knowledge, attitude, availability of facilities, and the effort of *Avian influenza* prevention strategy. Data obtained were analyzed by descriptive statistics. The result showed that only 52% of the poultry sellers' had good knowledge of early symptoms of *Avian influenza*. Amount 59% of the poultry sellers' had good attitudes. Result also showed that 73% of respondents had good facilities that was available in live poultry market area, but only 70% of respondents were good awareness about the effort of *Avian influenza* prevention strategy. In addition, the respondents who had more knowledge, good attitudes, and/or good facilities were also those who actually acted more preventively. Based on the result we concluded that the poultry sellers' perception on prevention strategy for infection of birdflu in Banda Aceh categorized as poor. It is suggested that compliance with preventive measures may be enhanced through behavioural modification and building awareness through communication, training, workshop programs to the live poultry market sellers' in Banda Aceh.

Keywords: *Avian influenza*, poultry seller, perception, Banda Aceh.

Introduction

Serum antibody is believed to provide clinically significant protection against influenza. Recently, we conducted local studies have noted that there were widespread *Avian influenza* virus in North Aceh, indicating a higher serum prevalence of H5N1 antibodies in domestical chickens (Darmawi *et al.* 2012). Our previously studies showed that laying hens immunized with *Avian influenza* vaccine was able to stimulate the defense mechanism, particularly regarding humoral immunity (Darmawi *et al.* 2011^a and 2011^b). Antibody not only circulated in blood serum, but also distributed in egg yolk as maternally antibody for day old chicken protection (Darmawi *et al.* 2010).

Biosecurity measures, aiming at the isolation of large poultry holdings, effectively prevent transmission from a place to another area by mechanical means, such as by contaminated equipment, vehicles, feed, cages, or clothing - especially shoes. Movements of infected flocks, mediated contacts during transport of poultry to slaughter houses, neighbourhood within a one kilometre radius around infected premises, lorries used for transport of feed, bedding or carcasses, other indirect contacts through exchange of farm staff, working machines suspected the risks for virus transmission.

Traditional live poultry markets play important role in mixing between waterfowl and the others domestic poultry such as chickens by replacing live animal. Most human *Avian influenza* infections occur among persons working or living with domesticated birds. Live poultry markets are essential for marketing poultry in many developing countries, and they are a preferred place for many people to purchase poultry for consumption throughout the world. The live poultry markets provide optimal conditions for the zoonotic transfer and evolution of infectious disease agents. Traditional Asian wet markets provide major contact points for people and live animal mixing (because of lack of refrigeration, animals are usually alive when sold), making them important potential sources of viral amplification and infection (Feilding *et al.* 2009).

In Banda Aceh Municipality significant numbers of poultry sellers are entirely dependent on live bird marketing. The interaction of humans with poultry in these settings provides considerable risk of exposure to virus. Poultry sellers usually provided live birds in markets, and involved physical contact with a live bird. Some knowledge and symptoms of birdflu at the poultry sellers are required to facilitate the adoption of preventive measures to avoid future occurrence. This will also provide an entry point for agricultural extension work and services. It

is against this background, that this study was designed to determine the level of poultry sellers' technical knowledge of risk the disease and self-protection practices and estimate degree of awareness about the effort of *Avian influenza* prevention strategy from live chicken sellers. We carried out a survey in Banda Aceh, a Municipality area in the top tip of Sumatra island, Indonesia during November to December 2011.

Materials and Methods

Setting

Primary data were obtained with the use of a structured questionnaire administered to respondents selected using proportional stratified random sampling. Amount of samples used in this study were determined base on the following formation:

$$n = \frac{N}{1 + N(d^2)}$$

Notes:

N= Total population (the total of poultry sellers' in Banda Aceh)

n = Amount of sample

d²= Margin error (margin error used 0,1)

We conducted this study in Banda Aceh Municipality in the top tip of Sumatra Island, Indonesia. We collected data from November to December 2011 in nine locations (Ulee Kareng, Batoh, Lamnyong, Kampong Baru, Peunayong, Setui, Kampong Ateuk, and Neusu). We selected these sites to include all of traditionally live bird market found in city, so it is possible to generalize all the findings of this study to all poultry sellers' throughout in Banda Aceh. We interviewed 99 respondents consist of 97 men and 2 women who were responsible for poultry sold in the market.

Interview Questionnaire

Socio-demographic information was collected for age, school education and gender. Information was obtained using the questionnaire sheets contain questions: knowledge, attitude, availability of facilities, and the effort of *Avian influenza* prevention strategy. A standardized, structured questionnaire collected information on demographic and knowledge of appropriate preventive measures, poultry and animal handling, and human influenza knowledge and treatment seeking. The questions were ranked for importance in preventing *Avian influenza* transmission in poultry or reducing human exposure and awarded 1 point for correct answers. Interviewers read the questions to the study participants and recorded responses on an answering sheet. For each respondent, the sum of scores for correct answers divided by the sum of available points generated a percentage score. Percentage scores for each respondent was ranked and classified as above or below the median. Scoring system categorized into two criteria: a poultry sellers' who has < 75% of maximal score is indicative poor perception, while an all round score of ≥75% is indicative of good perception of the *Avian influenza* disease.

Data collection

The criteria used to determine the poultry sellers' perception of bird flu were scoring system as described by Neupane *et al.* (2012) with modification: (1) the knowledge about the kind of agent caused bird flu and mode of disease transmission; symptoms and prevention of the disease was assayed by question with formulated answering options. (2) the attitudes toward this disease, compliance with precautions at work. Participants were asked to indicate they were using the following preventive measures when dealing with poultry (agree/not agree): washing hands with soap and water, donning gloves, face masks, boots/boots covers, putting on protective body garments, and washing and disinfecting utensils and surfaces. (3) Respondents were asked to name all protective measures they provide the facilities against the danger of being infected due to work with poultry, and the interviewers recorded the answers on the interview sheet (yes/no). (4) Perceptions of professional risk were measured by a question asking about the effort of bird flu prevention strategy whether respondents were used the facilities that available at the market area (yes/no).

Statistical analysis

Data obtained were applied by using percentages and analyzed by descriptive statistics.

Results and Discussion

Most of the respondents (77%) were within the economic active age group of 26-55 years. There was not respondent above 55 years old, and only 23% of the respondents were under 25 years. The greater proportion of the economically active age group is indicative of the potential that exist for adoption of any intervention that could serve as a preventive measure for future outbreak of bird flu. About 81% of respondents had educate at senior high school. The high level of education among poultry sellers in the area of this study could mean that most of the poultry sellers are into other professions and only embraced poultry rearing as a part-time venture. The majority of respondents (98%) were male, while the remaining 2% were female (Table 1). Majority of the respondents had attended upto high school and below one-third were illiterate which is corresponds the findings of Abbate *et al.* (2006) who reported that one third of the workers had a high school or college education. This result confirming that men dominated comercial poultry industry in Banda Aceh. A similar demographic study on poultry showed that men were more involved in poultry production (Neupane *et al.* 2012).

Table 1. Demographic characteristics of respondents

No	Characteristic of Respondents	Frequency(n)	Percentage (%)
1	Age		
	a. 15-25 years	23	23
	b. 26-55 years	76	77
	c. ≥ 56 years	0	0
	Total	99	100
2	Education		
	a. Elementary School	3	3
	b. Junior High School	12	12
	c. Senior High School	80	81
	d. Academy	1	1
	e. University	3	3
	Total	99	100
3	Gender		
	a. Female	2	2
	b. Male	97	98
	Total	99	100

Based on the scoring system adopted, we calculate the mean score is equal to 7.82. the median is 8, modus is 7, maximum score is 11, and minimum score is 2. Table 2 shows that 48% of respondents had poor knowledge of the disease, while about 52% had good knowledge of avian influenza (bird flu). This finding in line with another studied on farmers in some part of northern Nigeria, also reported "low" levels of knowledge about preventive behaviours regarding bird flu that only 26,32% had good knowledge and 17,11% very good knowledge (Bawa *et al.* 2010). This is unfortunate as birdflu is not only zoonotic but also cannot be treated after infection. Regarding our finding, this calls for the need to intensify efforts in organizing training workshops on prevention and handling the incidences of bird flu for poultry sellers at the grass root level by relevant governmental and non-governmental agencies.

Table 2. Distribution of knowledge about bird flu of respondents in traditionally market Banda Aceh

No	Knowledge	Frequency (n)	Percentage (%)
1.	Good	51	52
2.	Poor	48	48
Total		99	100

Our result regarding the attitudes about bird flu show that the mean score is equal to 2,17. the median is 2, modus is 2, maximum score is 5, and minimum score is 0. Compliance with precautions to avoid spreading virus while working, 59% of respondents had a good attitude indicated routinely washed their hands and disinfected surfaces, utensils, and wore

personal protective equipment that had been in contact with poultry. Some respondents (41%) were not aware about precautions categorized poor attitude because they were not routinely wearing personal protective equipment (Table 3). Knowledge, attitude and practice studies of individuals in bird handling occupations are relatively scant in the world literature. A recent study from Italy of 257 surveyed poultry workers noted a perceived low risk of H5N1, lack of knowledge of transmission routes and that the use of protective equipment and measures such as hand-washing were not routine. Educational attainment, risk perceptions and having training about H5N1 were positively associated with greater knowledge (Abbate *et al.* 2006).

Table 3. Distribution of attitudes about bird flu of respondents in traditionally market Banda Aceh

No	Attitude	Frequency (n)	Percentage (%)
1.	Good	58	59
2.	Poor	41	41
	Total	99	100

The majority of respondents (73%) were categorized in good regarding their answering that the facilities such as water, soaps, gloves, face masks, boots, body garments, were available in live poultry market area. However, 23% others were poor category because they did not provide the all of facilities (Table 4). This result supported the previously research that about a half of the poultry workers in Italy used the facilities for preventive measures regarding birdflu (Abbate *et al.* 2006). Kim *et al.* (2011) showed that poultry workers in China reported low-to-moderate levels of compliance with hand hygiene and other preventive measures (ranging from 7.3% using eye protection to 65.2% using handwashing with soap after slaughtering poultry). Another studied, Neupane *et al.* (2012) showed that the poultry workers in Nepal named soaps (88,5%), gloves (68,8%), face masks (53,1%), boots (15,6%), and body garments 8,3%).

Table 4. Perception of respondents for availability of facilities to prevent bird flu in traditionally market Banda Aceh

No	Facilities availability	Frequency (n)	Percentage (%)
1.	Good	72	73
2.	Poor	27	27
	Total	99	100

Among of the respondents, there were significant differences between the good and poor regarding the effort strategy for prevention of *Avian influenza*. Data in Table 5 showed that most of respondents (70%) had good effort of *Avian influenza* prevention strategy, only 30% of respondents had poor strategy. Some researchers described that the use of sanitizing equipment, the use of protective clothing, handwashing, sanitizing clothing is important to applied by poultry worker on regard controlling and preventing infectious diseases (Leslie *et al.* 2008; Fielding *et al.* 2009; Kim *et al.* 2010; Neupane *et al.* 2012).

Table 5. Distribution of respondents regarding the effort of *Avian influenza* prevention strategy in traditionally market in Banda Aceh

No	The effort strategy for prevention	Frequency (n)	Percentage (%)
1.	Good	69	70
2.	Poor	30	30
	Total	99	100

A half (52%) of the respondents had good knowledge. Regarding compliance with precautions to avoid spreading virus while working, amount 94,2% had good effort for prevention of bird flu. Meanwhile, 48% of the respondents had poor knowledge, 89,58% among of them had good effort for prevention of bird flu (Table 6). This finding supported previously studies on poultry workers in other countries which similarly found that those who had more knowledge were also those who actually acted more preventively is consistent with some other studies from the field (Leslie *et al.* 2008; Fielding *et al.* 2009; Kim *et al.* 2010; Neupane *et al.* 2012). Neupane *et al.* (2012) informed that knowledge about preventive measures was high with regard to some behaviours (hand washing), but medium to low with regard to others (using cleaning and disinfecting procedures or protective clothing). Abbate *et al.* (2006) reported that

improving knowledge of transmission is a useful public health strategy for reducing the effects of *Avian influenza* in poultry workers.

Table 6. Distribution of bird flu prevention based on respondents knowledge levels

Knowledge levels	The effort strategy for prevention					
	Good		Poor		Total	
	n	%	n	%	n	%
Good	48	94,12	3	5,88	51	100
Poor	43	89,58	5	10,42	48	100
Total	91		8		99	

About 59% of the respondents had good attitudes, amount of them (96,55%) had good effort for prevention of bird flu. Meanwhile, 41% of the respondents had poor attitudes, 85,36% among of them had good effort for prevention of bird flu (Table 7). This finding indicated that those who had more attitudes were also those who actually acted more preventively such as habitual washing and disinfecting of surfaces and utensils, customary use of gloves and face masks, and using special boots or protective body garments for controlling and preventing infectious disease. The attitudes depend heavily on respondent's compliance with recommendations on precautionary behavior. This compliance in turn depends on their knowledge, level of perceived risk, and willingness to adopt precautionary behavior.

Table 7. Distribution of bird flu prevention based on respondents attitudes

Attitudes	The effort strategy for prevention					
	Good		Poor		Total	
	n	%	n	%	n	%
Good	56	96,55	2	3,45	58	100
Poor	35	85,36	6	14,64	41	100
Total	91		8		99	

Regarding preventive measures, the highest number of respondents in good facilities had good effort strategy for prevention bird flu. Results indicate that there were between respondents who had good facilities compare the respondents who had poor facilities. Wearing personal protective equipment was done by 98,6% of respondents whom had good facility, but only 74,07% this strategy applied by poor facility availability (Table 8), although not a routine practice wore outer garments, boots or protective boot covers, gloves, face masks, eye protection, and washed their hands. This results in line with the previously study conducted by Kim *et al.* (2010) the majority of workers washed their hands sometime after killing chickens and the vast majority reported wearing gloves when handling poultry, the use of goggles was infrequently practiced and over one-third of respondents stated that they never used face masks when handling chickens, although the facilities available in the live poultry markets.

Table 8. Distribution of bird flu prevention based on facilities availability

Facilities	The effort strategy for prevention					
	Good		Poor		Total	
	n	%	n	%	n	%
Good	71	98,6	1	1,4	72	100
Poor	20	74,07	7	25,93	27	100
Total	91		8		99	

Conclusions

Based on the result we concluded that the poultry sellers' perception on prevention strategy for infection of birdflu in Banda Aceh categorized as poor knowledge of risk the bird flu, poor self-protection practices and poor of awareness about the effort of *Avian influenza* prevention strategy. It is suggested that compliance with preventive measures may be enhanced through behavioural modification and building awareness through communication, training, workshop programs to the live poultry market sellers' in Banda Aceh.

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